PROJECT NUMBER: 4009
PROJECT TITLE: Development Smoke Studies
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PERIOD COVERED: October, 1987

I. PROJECT STUDIO

A. Objective: Develop subjectively acceptable cigarettes with reduced sidestream visibility.

B. Status: The 12% $Mg(OH)_2$ wrapper was used on a 7mg tar model with the 2A blend for an extended test on the Internal Panel. Results are being tabulated. The same model also went to the Factory Panel, where it received an acceptability score of 4.0 versus a Marlboro Lights control with a 4.2 rating. This difference was significant. The same cigarette was also made in a 100 mm version, delivering 10mg tar. The Studio Panel found the model comparable to a Marlboro Lights 100 control. A new set of control and experimental cigarettes will be made with identical appearances for testing on the Factory Panel.

The same paper, blend, and flavor system as above in a 4 mg tar construction was tested on the O/C computerized panel with a Merit Ultra Lights control. There were no significant differences in any of the attributes for the single stick evaluations. Extended smoking is to be pursued.

An Ultra Slim model at 7mg tar with the 12% $Mg(OH)_2$ wrapper was made with a modified blend 2A for POL testing vs. Capri. The same cigarettes were also hand packed for an extended O/C panel test versus the regular TRIM model. Sidestream visibility reductions were 20-25 % for the regular TRIM and 70 % for the $Mg(OH)_2$ model compared to conventional cigarettes. A menthol companion is being designed with higher levels of menthol than previous prototypes.

Subjective and analytical differences between citrate and acetate additives on $Mg(OH)_2$ wrapper were explored. The burn rates and CO deliveries showed some variation, but were not consistent. Ecusta maintains that it requires higher levels of citrate than acetate to achieve the same burn rate, and since the level of acetate is already at 4-5 % they have continued using acetate. There is already acetate in the base sheet due to residue from the precipitation process for making $Mg(OH)_2$. Subjectively there are slight differences between the two additives, primarily in terms of smoothness and impact. A majority of Studio Panel smokers preferred the acetate model.

C. Plans: Complete Internal Panel Testing and evaluate results.

Make a Full Flavor, 60% reduced visibility model for internal testing.

Continue development of models with perforated, high $Mg(OH)_2$ levels and expanded tobaccos.

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II. TIPPING PAPER INVESTIGATIONS

A. **Objective**: Evaluate alternate tipping papers and plug wraps for their ability to conceal the joint on cigarettes with dual black/white filters.

B. **Results**: Six filter models were made with different plug wraps on the inner black section, the outer white section, and the combined filter. Each combination was made into cigarettes using five different tipping papers. The cigarettes were then tested for appearance on the O/C Panel.

Test results showed that the visibility of the joint between the two filter sections can be reduced or eliminated by changing the current Malaucene tipping to a higher opacity, 41g sheet in combination with a higher opacity combining wrap or by changing both the plug wrap and the combining wrap to one with a higher opacity. In this test the mechanically perforated combining wrap gave a better appearance than a high opacity porous combining wrap. Just changing the tipping paper gave an improvement, although it was not as noticeable as if the combining wrap was also changed.

Coal drop-off and filter flare-up testing of the control Malaucene tipping paper showed problems with the higher opacity combining wraps, while the experimental 41g tippings from both Ecusta and Kimberly-Clark performed well.

C. **Plans**: Assess the manufacturing impact of possible improvements.

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